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ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP
1725 K STREET, NW
SUITE 1000
WASHINGTON, DC 20006

EXAMINER

BALSIS, SHAY L

ART UNIT PAPER NUMBER

1744

DATE MAILED: 06/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/674,931

Applicant(s)

YAMAMOTO ET AL.

Examiner

Shay L Balsis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-15 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller (USPN 2004633) in view of Monz (EP 0716573).

Miller teaches a toothbrush comprising two types of tufting holes. The first type (3, 5) of holes are inclined in directions perpendicular to the lengthwise direction of the handle and the second type is vertical (4) to a tufting surface. The bristles in the inclined holes are tilted towards the inside so as to have the tufts support one another. Inclined tufts are supported by each other as well as by the vertical tufts (4). Each pair of tufts that are inclined towards each other form a converging block. Miller teaches all the essential elements of the claimed invention however fails to teach that the tufts are rectangular or elliptical.

Monz teaches a toothbrush comprising elliptical tufts that extend in a lengthwise direction of the handle length. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use elliptical bristle tufts instead of circular tufts. Circular tufts are disadvantageous because they tufts have substantially the same stiffness when the head is being moved across the teeth parallel to the gum line. It is desirable that when brushing, that bristles that are less stiff be used because they will prevent injury to the gum line. A way to achieve less stiffness is by using elongated tufts of bristles, i.e. elliptical or rectangular (col. 1, lines 31-49).

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Claims 1, 3, 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konczal (USPN 2464321) in view of Monz (EP 0716573).

Konczal teaches a toothbrush comprising two types of tufting holes. The first type (14) of holes are inclined in directions perpendicular to the lengthwise direction of the handle and the second type is vertical (15) to a tufting surface. The bristles in the inclined holes are tilted towards the inside so as to have the tufts support one another. Each pair of tufts that are inclined towards each other form a converging block. Konczal teaches all the essential elements of the claimed invention however fails to teach that the tufts are rectangular or elliptical.

Monz teaches a toothbrush comprising elliptical tufts that extend in a lengthwise direction of the handle length. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use elliptical bristle tufts instead of circular tufts. Circular tufts are disadvantageous because they tufts have substantially the same stiffness when the head is being moved across the teeth parallel to the gum line. It is desirable that when brushing, that bristles that are less stiff be used because they will prevent injury to the gum line. A way to achieve less stiffness is by using elongated tufts of bristles, i.e. elliptical or rectangular (col. 1, lines 31-49).

Claims 1, 3, 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crawford (USPN 2040245) in view of Monz (EP 0716573).

Crawford teaches a toothbrush comprising two types of tufting holes. The first type (figure 4) of holes are inclined in directions perpendicular to the lengthwise direction of the handle and the second type is vertical (figure 3) to a tufting surface. The bristles in the inclined holes are tilted towards the inside so as to have the tufts support one another. The inclined bristles have been worked into a V-shape. Each pair of tufts that are inclined towards each other form a converging block. Behind a first row of converging blocks is a space for the vertical tufts. Behind the vertical

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tufts is another row of converging blocks. Crawford teaches all the essential elements of the claimed invention however fails to teach that the tufts are rectangular or elliptical.

Monz teaches a toothbrush comprising elliptical tufts that extend in a lengthwise direction of the handle length. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use elliptical bristle tufts instead of circular tufts. Circular tufts are disadvantageous because they tufts have substantially the same stiffness when the head is being moved across the teeth parallel to the gum line. It is desirable that when brushing, that bristles that are less stiff be used because they will prevent injury to the gum line. A way to achieve less stiffness is by using elongated tufts of bristles, i.e. elliptical or rectangular (col. 1, lines 31-49).

Claims 1, 3, 4, 6, 8, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaufman et al. (USPN 4570282) in view of Monz (EP 0716573).

Kaufman teaches a toothbrush comprising tufting holes that are inclined in directions perpendicular to the lengthwise direction of the handle. The bristles in the inclined holes are tilted towards the inside, at an inclination of 10 degrees, so as to have the tufts support one another (30, 38). Each pair of tufts that are inclined towards each other form a converging block. The tufting holes account for 16-22 mm in a direction of the handle length (col. 4, lines 30-65). Figure 1 show the proportion of the width tufting holes to the length of tufting holes. Since the length of the tufting holes is between 16 and 22 mm, it can be determined that the width of the tufting holes is less than half the length and therefore would be 8 mm or less. The distance between the bases of the pairs of tufts is approximately 2.5 mm (col. 4, lines 30-65). Kaufman teaches all the essential elements of the claimed invention however fails to teach that the tufts are rectangular or elliptical.

Monz teaches a toothbrush comprising elliptical tufts that extend in a lengthwise direction of the handle length. It would have been obvious to one of ordinary skill in the art at the time the

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invention was made to use elliptical bristle tufts instead of circular tufts. Circular tufts are disadvantageous because they tufts have substantially the same stiffness when the head is being moved across the teeth parallel to the gum line. It is desirable that when brushing, that bristles that are less stiff be used because they will prevent injury to the gum line. A way to achieve less stiffness is by using elongated tufts of bristles, i.e. elliptical or rectangular (col. 1, lines 31-49).

Claims 1, 3, 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller (USPN 2004633) in view of Oishi et al. (USPN 5799353).

Miller teaches a toothbrush comprising two types of tufting holes. The first type (3, 5) of holes are inclined in directions perpendicular to the lengthwise direction of the handle and the second type is vertical (4) to a tufting surface. The bristles in the inclined holes are tilted towards the inside so as to have the tufts support one another. Inclined tufts are supported by each other as well as by the vertical tufts (4). Each pair of tufts that are inclined towards each other form a converging block. Miller teaches all the essential elements of the claimed invention however fails to teach that the tufts are rectangular or elliptical and that the tufts are worked into a V-shape.

Oishi et al. teaches a toothbrush with elliptical tuft holes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use elliptical tuft holes as taught by Oishi. The motivation for doing so would be to provide a toothbrush that effectively removes plaque attached to or deposited on all the regions of the tooth surface, interdental space and cervical margin, and to conduct efficient tooth brushing (Oishi abstract). Therefore, it would have been obvious to combine Oishi with Miller to obtain the invention as specified in claim 1.

Additionally, Oishi et al. teaches a toothbrush comprising bristles tufts that are shaped in a V-formation (figure 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to shape Miller's bristles in V-formation to allow for strong stiffness of the

bristles and excellent plaque removal efficacy while suppressing excessive stimulation to gingiva (col. 4, lines 1-45).

Claims 1, 3, 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konczal (USPN 2464321) in view of Oishi et al. (USPN 5799353).

Konczal teaches a toothbrush comprising two types of tufting holes. The first type (14) of holes are inclined in directions perpendicular to the lengthwise direction of the handle and the second type is vertical (15) to a tufting surface. The bristles in the inclined holes are tilted towards the inside so as to have the tufts support one another. Each pair of tufts that are inclined towards each other form a converging block. Konczal teaches all the essential elements of the claimed invention however fails to teach that the tufts are rectangular or elliptical.

Oishi et al. teaches a toothbrush comprising elliptical tuft holes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use elliptical tuft holes as taught by Oishi. The motivation for doing so would be to provide a toothbrush that effectively removes plaque attached to or deposited on all the regions of the tooth surface, interdental space and cervical margin, and to conduct efficient tooth brushing (Oishi abstract). Therefore, it would have been obvious to combine Oishi with Konczal to obtain the invention as specified in claim 1.

Additionally, Oishi et al. teaches a toothbrush comprising bristles tufts that are shaped in a V-formation (figure 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to shape Konczal's bristles in V-formation to allow for strong stiffness of the bristles and excellent plaque removal efficacy while suppressing excessive stimulation to gingiva (col. 4, lines 1-45).

Claims 1, 3, 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crawford (USPN 2040245) in view of Oishi et al. (EP 5799353).

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Crawford teaches a toothbrush comprising two types of tufting holes. The first type (figure 4) of holes are inclined in directions perpendicular to the lengthwise direction of the handle and the second type is vertical (figure 3) to a tufting surface. The bristles in the inclined holes are tilted towards the inside so as to have the tufts support one another. The inclined bristles have been worked into a V-shape. Each pair of tufts that are inclined towards each other form a converging block. Behind a first row of converging blocks is a space for the vertical tufts. Behind the vertical tufts is another row of converging blocks. Crawford teaches all the essential elements of the claimed invention however fails to teach that the tufts are rectangular or elliptical.

Oishi et al. teaches a toothbrush with elliptical tuft holes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use elliptical tuft holes as taught by Oishi. The motivation for doing so would be to provide a toothbrush that effectively removes plaque attached to or deposited on all the regions of the tooth surface, interdental space and cervical margin, and to conduct efficient tooth brushing (Oishi abstract). Therefore, it would have been obvious to combine Oishi with Crawford to obtain the invention as specified in claim 1.

Claims 1, 3, 4, 6-8, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaufman et al. (USPN 4570282) in view of Oishi et al. (USPN 5799353).

Kaufman teaches a toothbrush comprising tufting holes that are inclined in directions perpendicular to the lengthwise direction of the handle. The bristles in the inclined holes are tilted towards the inside, at an inclination of 10 degrees, so as to have the tufts support one another (30, 38). Each pair of tufts that are inclined towards each other form a converging block. The tufting holes account for 16-22 mm in a direction of the handle length (col. 4, lines 30-65). Figure 1 show the proportion of the width tufting holes to the length of tufting holes. Since the length of the tufting holes is between 16 and 22 mm, it can be determined that the width of the tufting holes is less than

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half the length and therefore would be 8 mm or less. The distance between the bases of the pairs of tufts is approximately 2.5 mm (col. 4, lines 30-65). Kaufman teaches all the essential elements of the claimed invention however fails to teach that the tufts are rectangular or elliptical.

Oishi et al. teaches a toothbrush with elliptical tuft holes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use elliptical tuft holes as taught by Oishi. The motivation for doing so would be to provide a toothbrush that effectively removes plaque attached to or deposited on all the regions of the tooth surface, interdental space and cervical margin, and to conduct efficient tooth brushing (Oishi abstract). Therefore, it would have been obvious to combine Oishi with Kaufman to obtain the invention as specified in claim 1.

Additionally, Oishi et al. teaches a toothbrush comprising bristles tufts that are shaped in a V-formation (figure 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to shape Kaufman's bristles in V-formation to allow for strong stiffness of the bristles and excellent plaque removal efficacy while suppressing excessive stimulation to gingiva (col. 4, lines 1-45).

Claims 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller in view of Curtis et al. (USPN 5446940) or Crawford in view of Curtis et al. (USPN 5446940) or Konczal in view of Curtis et al. (USPN 5446940) or Kaufman et al. in view of Curtis (USPN 5446940). Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller in view of Curtis et al. (USPN 5446940) or Crawford in view of Curtis et al. (USPN 5446940) or Konczal in view of Curtis et al. (USPN 5446940).

Miller, Crawford, Konczal and Kaufman teach all the essential elements of the claimed invention however, the references fails to teach tufting holes that are rectangular in shape, with short

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side dimensions of 0.8 to 2.0 mm and long side dimensions of 1.5 to 5.0 mm. Miller, Crawford and Konczal fail to teach a distance of .2 to 4.0 mm between converging blocks.

Curtis et al. discloses a distance at the base between of the paired tufts to be about 0.065 in (1.65 mm). The paired tufts can include the bristles next to each other on the brush head such as the first pair of bristles (30) on figure 7 on the bottom left corner (col. 6, lines 1-8). The bristles (30) are in the same lateral row as the middle bristles (32) and therefore the spacing between the rows of middle bristles (32) is the same as the spacing between outside bristles (30). Curtis also teaches rectangular tufting holes that accommodate rectangular tufts. The dimensions of the tuft are 0.047 in (1.193 mm) on the shortest side and 0.060 in (1.52 mm) on the longest side (col. 6, lines 38-47). As shown in figure 7, the longest side of the tuft hole is in the lengthwise direction of the handle. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use rectangular tufts because rectangular tufts sweep plaque off tooth surfaces and also optimize the resiliency as compared to round tufts as claimed.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller in view of Solanki et al. (USPN 6314605) or Konczal in view of Solanki et al. (USPN 6314605) or Kaufman et al. in view of Solanki et al. (USPN 6314605).

Miller, Konczal and Kaufman teach all the essential elements of the claimed invention however, the references fail to teach rows of converging blocks that are offset from each other. Solanki et al. teaches a toothbrush with bristles tufts offset from each other as shown in figure 4. It would be obvious to one of ordinary skill in the art to have the paired bristle tufts or converging blocks in one row offset from the converging blocks in the next row in Miller, Konczal and Kaufman's invention as shown in Solanki's invention to allow the tufts or converging blocks to

operate independently of each other to avoid obstruction from other tufts or converging blocks. Thus, allowing the tufts to penetrate better into interproximal areas (col. 4, lines 27-38).

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller in view of Chen et al. (USPN 5590438) or Crawford in view of Chen et al. (USPN 5590438) or Konczal in view of Chen et al. (USPN 5590438) or Kaufman et al. in view of Chen et al. (USPN 5590438).

Miller, Crawford, Konczal and Kaufman disclose all the essential elements of the claimed invention including groups of tufts that are anchored into round cavities, however, the references are silent about the type of anchoring means used. Chen et al. teaches a method of anchoring bristles to a toothbrush. Chen teaches folding the bristle tuft in half, placing in a tuft cavity and driving an anchor into the tuft cavity to hold the bristles into the tuft cavity. The anchor can be positioned numerous ways based on the tuft shape as shown in figures 6-11, such as one where the anchor is parallel to the short side of the tuft cavity as in figure 10. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Chen's method of anchoring as the anchoring method in Miller, Crawford, Konczal and Kaufman's invention to prevent bristles from loosening and falling out of their tuft cavities (col. 1, lines 26-40).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller in view of Chen et al. (USPN 5590438) or Crawford in view of Chen et al. (USPN 5590438) or Konczal in view of Chen et al. (USPN 5590438) or Kaufman et al. in view of Chen et al. (USPN 5590438) as applied to claim 11 above and further in view of Solanki et al.

Miller in view of Chen, Crawford in view of Chen, Konczal in view of Chen and Kaufman in view of Chen disclose all the essential elements of the claimed invention however the references fail to teach bristles that are not lined up on one straight line in the lengthwise direction of the handle.

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Solanki et al. teaches a toothbrush with bristles tufts offset from each other as shown in figure 4. This in turn teaches bristles that are not lined up in a straight line in the lengthwise direction of the handle. It would have been obvious to one of ordinary skill in the art at the time the invention was made to offset the bristles as taught by Solanki to allow the bristles to operate independently of each other to avoid obstruction from other tufts or converging blocks. Thus, allowing the tufts to penetrate better into interproximal areas (col. 4, lines 27-38).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miller in view of Nicolas (USPN 4706322) or Crawford in view of Nicolas (USPN 4706322) or Konczal in view of Nicolas (USPN 4706322).

Miller, Crawford and Konczal all teach the essential elements of the claimed invention however, the references fail to teach the exact size of the head of the toothbrush that is occupied by tuft holes.

Nicolas teaches a brush head that has a width of 12 mm and a length of 20 mm. As shown in figure 1, the tufting holes account for a majority of the brush head and therefore account for 10-30 mm in the direction of the handle length and 5-15 mm in the direction of the handle width. It would have been obvious to one of ordinary skill in the art to have the bristle tufts occupy the claimed space on the brush head to optimize the brushing performance.

Allowable Subject Matter

Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Claim 16 states the limitation that there are five rows of tufts in the lengthwise direction with rows one and five forming a converging block, rows two and four forming two converging blocks and row three forming one converging block. None of the prior art teaches the exact number of converging blocks per row. Therefore, the claim is free from the prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shay L Balsis whose telephone number is 571-272-1268. The examiner can normally be reached on 7:30-5:00 M-Th, alternating F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert J. Warden can be reached on 571-272-1281. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Slb
6/8/04


Terrence R. Thi
Primary Examiner